

Remarks

The Office Action dated July 3, 2008 has been carefully considered. Applicants have amended claim 1 of the current application without the addition of new matter. Claims 11-18 and 20 have been cancelled without prejudice and based on a restriction requirement. The applicants reserve the right to reintroduce these claims at a later date. Applicants respectfully request reconsideration of the rejections.

Specification Objection – Abstract

In Paragraph 3 of the Office Action, the Abstract of the disclosure is objected to as being too long. The Abstract is as follows:

The present invention relates to processes for purifying a composition containing (meth)acrylic acid, at least one impurity and water, wherein the composition has a water content in the range of 0.55 to 90, based on the composition, to form a purified phase containing (meth)acrylic acid and at least one impurity, wherein, in the purified phase, the quantity of at least one impurity is less than 7% by weight, based on (meth)acrylic acid in the purified phase.

Using the word count function, the number of words in the above Abstract is seventy-six. The Abstract does not exceed 150 words as required by 37 CFR 1.72(b). Applicants respectfully request the examiner withdraw the objection to the Abstract.

Claim Rejections – 35 USC § 112

In Paragraph 4 of the Office Action, claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants have amended claim 1 to reflect

measurements by percent weight based on the composition. Support for this amendment can be found on page 5, lines 28-30, of the specification. Applicants submit the above amendment puts claim 1 in condition for allowance. Applicants respectfully request the examiner allow claims 1-8.

Claim Rejections – 35 USC § 102

In Paragraph 5 of the Office Action, claims 1, 2, 4 and 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Pascoe et al. (US 4,780,568). The examiner contends that Pascoe discloses a process for the purification of methacrylic acid comprising crystallization of substantially anhydrous methacrylic acid under refrigeration. Office Action ¶ 5.

The fact that Pascoe et al. discloses substantially anhydrous conditions is sufficient to distinguish it from the current invention. An anhydrous composition is a composition that has no water or wherein all of the water is removed. The current invention claims a process wherein the composition has a water content in the range of about 10 to about 85% by weight, based on the composition. Am. Claim 1. Pascoe's anhydrous conditions teach away from the current invention. Anhydrous conditions are fundamentally different than that of the current invention; therefore, it does not follow that the process disclosed in Pascoe et al. would produce the crystals as required in claim 2 as the examiner contends. Additionally, Pascoe et al. does not teach that the crystals possess a tubular recess and that the impurities are able to flow out or be washed out through the open recesses. Spec. 9, ll. 8-18. For the reasons stated above and based on the amendment to claim 1, Applicants respectfully submit that claims 1, 2, and 4-8 are in condition for allowance.

In Paragraph 6 of the Office Action, claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Eck et al. (WO 01/77056-A1 10-2001) as evidenced by Eck et al (US 7,112,695 09-2006). The examiner contends Eck et al. discloses the use of crude acrylic acid containing 10% water. Office Action ¶ 6. Applicants respectfully disagree with the examiner's interpretation of Eck et al. Eck et al. discloses a process carried out in the presence of water at certain percentages based on the weight of the acrylic acid contained in the crude acrylic acid. Col. 9, ln. 19-24. Specifically, Eck et al. discloses 0.2 to 10% of water *by weight of the acrylic acid present*. Col. 8, ln. 45-49; col. 12, ln. 22-34; col. 13, ln. 33-34. The amount of acrylic acid in the composition disclosed by Eck et al. will always be less than 100% by weight of the composition. Therefore, the amount of water disclosed by Eck et al. will always be less than 10% by weight of its composition. The current invention claims from about 10 to about 85% of water *by weight of the composition*. Am. Claim 1. Eck et al. does not anticipate the percentage of water found in the amended claim. Additionally, Eck et al. does not disclose that a portion of the melt is recycled to step a) or step b). See Am. Claim 1. Eck et al. does disclose that the wash melt is recycled to the wash column. Col. 11, ln. 59-65. However, recycling the wash melt into the wash column is not sufficient to anticipate the recycled melt being used to crystallize (meth)acrylic acid from the composition or separating the (meth)acrylic acid crystals from the mother liquid. See Am. Claim 1(d). For the reasons stated above and based on the amendment to claim 1, Applicants respectfully submit that claims 1-8 are in condition for allowance.

Provisional Claim Rejections – Double Patenting

In Paragraph 7 of the Office Action, claims 1-8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 16 and 19-23 of copending Application No. 10/466,176 ("176"). It is noted that the claims in the '176 application have not been allowed, and a response to the 7/21/08 Office Action was filed on December 22, 2008.

The current invention claims a process that purifies a composition comprising (meth)acrylic acid, at least one impurity and *water*. Am. Claim 1. The water content of the composition is in the range of about 10 to about 85% by weight based on the composition. The current invention does not claim a process to purify a composition comprising less than about 10% by weight, based on the composition, of water. The only independent claim of the '176 application reads as follows:

16. (Currently Amended) A continuous process for the purification of acrylic acid, having the formula $\text{CH}_2\text{-CH-COOH}$, comprising a process stage that comprises the following process steps:

- a) acrylic acid is crystallized out from a mother liquor by a continuous crystallization method;
- b) crystallized acrylic acid is separated from the mother liquor;
- c) at least part of the separated acrylic acid crystals are melted; and
- d) the melted part is at least partially recycled to step a) or to step b).

Application '176 currently does not claim a process for the purification of acrylic acid wherein said acrylic acid is in a composition that has a water content in the range of about 10 to about 85% by weight, based on the composition. The examiner contends that “[o]ne of ordinary skill in the art would expect the composition of then [sic] purification feed to have a significant impact on the success of any purification procedure and would therefore adjust the water content of the purification feed in the course of optimizing the process.” Office Action ¶ 7. The examiner goes on to contend that such optimization is of a “routine nature” which would have had a “reasonable expectation for success.” Applicants respectfully disagree that adjusting the water content of the purification feed is a routine act for optimization and that there would be a reasonable expectation for success. Applicants direct the examiner’s attention to both the Pascoe and Eck references cited in the Office Action which disclose little or no water in such compositions. *See e.g.*, Eck et al., Col. 9, ln. 27-29 (“Usually, however, the preparation results in crude acrylic acid which is essentially or completely free of water.”). Applicants reserve the right to file a terminal disclaimer if a nonprovisional nonstatutory double patenting rejection is entered.

Conclusion

In light of the amendments and remarks presented herein, Applicants submit that the present application is in condition for allowance, and such action is respectfully requested. If, however, any issues remain unresolved, the Examiner is invited to telephone Applicant's counsel at the number provided below.

Respectfully submitted,

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